

## CLAIMS

What is claimed is:

1. A transmission system, comprising:  
a content server;  
5 an optical transmitter having an input connected to the content server and having an output for producing optical signals indicative of content on the server;  
an optical switching device for selectively multi-casting optical signals, including:  
an optical duplicator having an input connected to the output of the transmitter and having a plurality of outputs;  
10 a plurality of separately controllable optical switching elements connected to the outputs of the optical duplicator;  
a plurality of optical receivers connected to the switching device and receiving multicast optical signals.
- 15 2. The system of claim 1, wherein the optical switching device is configured to transmit multi-cast the information to less than all of the optical receivers.
3. The system of claim 1, wherein the optical transmitter is configured to transmit all of the multicast signals on a single wavelength.
- 20 4. The system of claim 1, wherein the transmitter is configured to transmit the multicast signals on a plurality of wavelengths.
5. The system of claim 1, further comprising a plurality of storage devices  
25 connected to the receivers and forming a storage area network.
6. The system of claim 5, wherein the storage area network includes a plurality of transmitters for transmitting signals indicative of the status of the storage area network.
- 30 7. The system of claim 1, further comprising a cable box connected to one of the receivers.

8. The system of claim 7, wherein the cable box includes a transmitter for transmitting content requests back into the system.

5 9. The system of claim 8, wherein the content server provides video on demand services.

10. The system of claim 1, wherein:

the optical signals are transmitted on a plurality of wavelengths;

the switching device includes:

10 a plurality of duplicators corresponding to the plurality of wavelengths;

a plurality of combiners, each combiner having a plurality of inputs and an output, wherein each combiner receives an input from each duplicator and wherein the output of each combiner is connected to a switch element.

15 11. A communications network, comprising:

a content server;

an optical network including a plurality of nodes connected by optical transmission media, wherein at least one node is connected to the content server;

an optical switching device for selectively multi-casting optical signals, including:

20 an optical duplicator having an input connected to the output of the transmitter and having a plurality of outputs;

a plurality of separately controllable optical switching elements connected to the outputs of the optical duplicator;

25 a plurality of optical receivers connected to the switching device and receiving multicast optical signals;

an electrical network including a plurality of terminals;

an electrical transmitter connected to the optical receiver and transmitting electrical signals indicative of received optical signals;

30 12. The system of claim 11 wherein the optical network includes:

an optical backbone network; and

a plurality of smaller optical networks, wherein the smaller optical networks are connected to the optical backbone networks through a plurality of nodes.

5 13. The system of claim 12, further comprising a head end between the electrical network and one of the smaller networks.

14. The system of claim 13, wherein the head end includes a plurality of hubs.

10 15. The system of claim 12 wherein the optical switching device receives content from a node in the backbone network.

16. The system of claim 12 wherein the optical switching device receives content from a node in the smaller network.

15 17. The system of claim 12 wherein the optical switching device receives content from a node in the national network.

20 18. A storage area network comprising:  
a plurality of content servers;  
a plurality of storage devices;  
a first plurality of optical transmitters connected to the plurality of content servers and configured to transmit information from the content servers;  
a second plurality of optical transmitters connected to the plurality of storage devices and configured to transmit information from the storage devices;  
25 a plurality of optical receivers connected to the storage devices;  
a plurality of optical switching devices for selectively multi-casting optical signals, wherein each optical switching device includes:  
an optical duplicator having an input connected to an output of one of the transmitters and having a plurality of outputs;  
30 a plurality of separately controllable optical switching elements connected to the outputs of the optical duplicator.

19. The network of claim 18, wherein each content server multi-casts information through one of the optical switching devices to one of the storage devices.

20. The network of claim 20, wherein each storage device multi-casts information  
5 through one of the optical switching devices to one of the storage devices.

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